

Curriculum Vitae

John F. Bratton

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EDUCATION

University of California at Berkeley	1997, Geology, Ph.D.
Brown University	1987, Geology-Chemistry, Sc.B.

EMPLOYMENT HISTORY

2011-present	NOAA, Great Lakes Environmental Research Laboratory, Ann Arbor, MI Deputy Director, Acting Director since August 2013
1997-2011	USGS, Center for Coastal and Marine Geology, Woods Hole, MA Geologist; Primary Projects: Coastal Groundwater Systems, Sedimentary Geochemical Characterization of Chesapeake Bay Environmental History
1996-1997	Berkeley Center for Isotope Geochemistry at Lawrence Berkeley National Laboratory, Graduate Student Researcher, Alameda Naval Air Station, Project: Isotopic Characterization of Intrinsic Microbial Bioremediation
1994-1995	ERM-West, Inc., Walnut Creek, CA Senior Environmental Geologist
1994	University of California Museum of Paleontology Graduate Student Supervisor
1991-1993	Balsam Environmental Consultants, Inc. (now URS), Salem, NH Project Geologist
1988-1991	Roy F. Weston, Inc., Concord (now Manchester), New Hampshire Assistant Project Geologist

TEACHING EXPERIENCE

- 2013-present Wayne State University, Detroit, Michigan, Adjunct Associate Professor, Course: Glacial Geology, advanced undergraduate and graduate level
- 2006-2010 Stonehill College, Easton, Massachusetts, Part-Time Faculty Member, Course: Environmental Geology, undergraduate level
- 2001-2009 Au Sable Institute of Environmental Studies, Great Lakes Campus, Mancelona, Michigan, Associate Professor, Courses: Field Geology, Land Resources; advanced undergraduate level
- 2001 Boston University, Dept. of Earth Sciences, Lecturer, Course: Marine Geology, advanced undergraduate and graduate level
- 2000, 2007-08 Bridgewater State College, Massachusetts, Dept. of Earth Sciences, Visiting Assoc. Professor, Courses: Biological Oceanography (incl. Chemical), Physical Oceanography (incl. Geological), both advanced undergraduate level; Environmental Geology, undergraduate level
- 1997 (fall) Harvard University, Department of Earth and Planetary Sciences, Grader, Course: Biogeochemistry
- 1993-1995 University of California at Berkeley
Graduate Student Instructor: Physical Geology (incl. labs and field trips), Environmental Geology, Introduction to Environmental Science (two semesters, including labs, discussion sections, and field trips), Freshman Field Seminar (California Gold Country)
- 1988 Science Museum of Minnesota, St. Paul, Minnesota, Science Interpreter
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PROFESSIONAL PUBLICATIONS

Russoniello, Christopher J., Cristina Fernandez, John F. Bratton, Joel F. Banaszak, David E. Krantz, A. Scott Andres, Leonard F. Konikow, Holly A. Michael, 2013, Geologic effects on groundwater salinity and discharge into an estuary, *Journal of Hydrology*, vol. 498, p. 1-12, 10.1016/j.jhydrol.2013.05.049.

Moseman-Valtierra, Serena, Rosalinda Gonzalez, Kevin D. Kroeger, Jianwu Tang, Wei Chun Chao, John Crusius, John Bratton, Adrian Green, James Shelton, 2011, Short-term nitrogen additions can shift a coastal wetland from a sink to a source of N₂O, *Atmospheric Environment*, vol. 45(26), p. 4390-4397, ISSN 1352-2310, 10.1016/j.atmosenv.2011.05.046.

Zhao, Sherry, Pengfei Zhang, John Crusius, Kevin D. Kroeger, and John F. Bratton, 2011, Use of pharmaceuticals and pesticides to constrain nutrient sources in coastal groundwater of northwestern Long Island, New York, USA, *Journal of Environmental Monitoring*, vol. 13, p. 1337-1343, DOI: 10.1039/C1EM10039D.

Bratton, John F., 2010, The three scales of submarine groundwater flow and discharge across passive continental margins, *Journal of Geology*, vol. 118, p. 565-575.

Agnihotri, R., Naqvi, S.W.A., Siby, K., Altabet, M., and Bratton, J.F., 2009, Is $\delta^{15}\text{N}$ of sedimentary organic matter a good proxy for paleodenitrification in coastal waters of the eastern Arabian Sea?, in *Indian Ocean Biogeochemical Processes and Ecological Variability*, Wiggert, J.D., Hood, R.R., Wajih, S., Naqvi, A., Brink, K.H., and Smith, S.L., eds., AGU Geophysical Monograph Series, vol. 185, p. 321-332.

Bratton, John F., Böhlke, J.K., Krantz, David E., and Tobias, Craig R., 2009, Flow and geochemistry of groundwater beneath a back-barrier lagoon: The subterranean estuary at Chincoteague Bay, Maryland, USA, *Marine Chemistry*, vol. 113, p. 78-92, doi: 10.1016/j.marchem.2009.01.004.

Shedlock, R.J., and Bratton, J.F., 2009, Groundwater contributes nutrients to the Coastal Bays, in *Shifting Sands: Environmental and cultural change in Maryland's Coastal Bays*, Dennison, W.C., Thomas, J.E., Cain, C.J., Carruthers, T.J.B., Hall, M.R., Jesien, R.V., Wazniak, C.E., and Wilson, D.E., eds., University of Maryland Center for Environmental Science, Integration and Application Network, 396 p.

Spruill, Timothy B., and John F. Bratton, 2008, Estimation of groundwater and nutrient fluxes to the Neuse River Estuary, North Carolina, *Estuaries and Coasts*, v. 31, p. 501-520, doi: 10.1007/s12237-008-9040-0.

Bratton, John F., 2007, The importance of shallow confining units to submarine groundwater flow, in *A New Focus on Groundwater-Seawater Interactions*, Sanford, W., Langevin, C., Polemio, M., and Povinec, P., eds., International Association of Hydrological Sciences Publication 312, p. 28-36.

Crusius, J., D. Koopmans, J. Bratton, M. Charette, K. Kroeger, P. Henderson, L. Ryckman, K. Halloran, and J. Colman, 2005, Submarine groundwater discharge to a small estuary estimated from radon and salinity measurements and a box model, *Biogeosciences*, v. 2, p. 141-157.

Bratton, J.F., Böhlke, J.K., Manheim, F.M., and Krantz, D.E., 2004, Submarine ground water in Delmarva Peninsula coastal bays: Ages and nutrients, *Ground Water*, v. 42, no. 7, p. 1021-1034.

Manheim, F.T., Krantz, D.E., and Bratton, J.F., 2004, Studying ground water beneath Delmarva coastal bays using electrical resistivity, *Ground Water*, v. 42, no. 7, p. 1052-1068.

Krantz, D.E., Manheim, F.T., Bratton, J.F., and Phelan, D.J., 2004, Hydrogeologic setting and ground-water flow beneath a section of Indian River Bay, Delaware, *Ground Water*, v. 42, no. 7, p. 1035-1051.

Bratton, J.F., Colman, S.M., and Seal, R.S., II, 2003, Eutrophication and carbon sources in Chesapeake Bay over the last 2700 years: Human impacts in context, *Geochimica et Cosmochimica Acta*, v. 67, no. 18, p. 3385-3402.

Colman, Steven M., and John F. Bratton, 2003, Anthropogenically induced changes in sediment and biogenic silica fluxes in Chesapeake Bay, *Geology*, v. 31, no. 1, p. 71-74.

Bratton, John F., Steven M. Colman, E. Robert Thielert, and Robert R. Seal, II, 2002, Birth of the modern Chesapeake Bay estuary 7,400 to 8,200 years ago and implications for global sea-level rise, *Geo-Marine Letters*, v. 22, p. 188-197.

Colman, S.M., Baucom, P.C., Bratton, J.F., Cronin, T.M., McGeehin, J.P., Willard, D., Zimmerman, A.R., and Vogt, P., 2002, Radiocarbon dating, chronologic framework, and changes in accumulation rates of Holocene estuarine sediments from Chesapeake Bay, *Quaternary Research*, v. 57, p. 58-70.

Cronin, T., S. Colman, D. Willard, R. Kerhin, C. Holmes, A. Karlsen, S. Ishman, J. Bratton, 1999, Interdisciplinary environmental project probes Chesapeake Bay down to the core, *Eos*, 80(21), p. 237, 240-241.

Bratton, John F., 1999, Clathrate eustasy: Methane hydrate melting as a mechanism for geologically rapid sea-level fall, *Geology*, vol. 27, no. 10, p. 915 - 918.

Bratton, John F., William B.N. Berry, and Jared R. Morrow, 1999, Anoxia pre-dates Frasnian-Famennian boundary mass extinction horizon in the Great Basin, USA, *Palaeogeography, Palaeoclimatology, Palaeoecology*, vol. 154, no. 3, p. 275-292.

USGS PUBLICATIONS

Cross, V.A., Bratton, J.F., Kroeger, K.D., Crusius, J., and Worley, C.R., 2013, Continuous resistivity profiling data from Great South Bay, Long Island, New York, USGS Open-File Report 2011-1040, <http://pubs.usgs.gov/of/2011/1040/>.

Cross, V.A., J.F. Bratton, J. Crusius, K.D. Kroeger, C.R. Worley, 2012, Continuous resistivity profiling data from Manhasset Bay and Northport Harbor, Long Island, New York, USGS Open-File Report 2011-1041.

Cross, V.A., J.F. Bratton, C.W. Worley, J. Crusius, and K.D. Kroeger, 2011, Continuous resistivity profiling data from the Corsica River Estuary, Maryland, USGS Open-File Report 2010-1094.

Cross, V.A., Foster, D.S., and Bratton, J.F., 2010, Continuous resistivity profiling and seismic-reflection data collected in 2006 from the Potomac River Estuary, Virginia and Maryland, USGS OFR 2009-1151.

Cross, V., Bratton, J.F., Crusius, J., Colman, J.A., and McCobb, T.D., 2008, Submarine hydrogeological data from Cape Cod National Seashore, USGS OFR 2006-1169.

Kroeger, K. D., P. W. Swarzenski, J. Crusius, J. F. Bratton, M. A. Charette, 2007, Submarine Ground-Water Discharge: Nutrient Loading and Nitrogen Transformations, USGS Fact Sheet 2006-3110.

Cross, VeeAnn A., John F. Bratton, Emile Bergeron, Jeff K. Meunier, John Crusius, and Dirk Koopmans, 2006, Continuous resistivity profiling data from the upper Neuse River Estuary, North Carolina, 2004-2005, USGS OFR 2005-1306.

Crusius, J., Bratton, J., and Charette, M., 2004, Putting radon to work; identifying coastal groundwater discharge sites, USGS OFR 2004-1381.

Swarzenski, P.W., J.F. Bratton, and J. Crusius, 2004, Submarine ground-water discharge and its role in coastal processes and ecosystems, USGS OFR 2004-1226.

Bratton, John, Guntenspergen, Glenn, Taggart, Bruce E, Wheeler, Douglas, Bjorklund, Lynn, Bothner, Michael, Kotra, Rama, Lent, Robert, Mecray, Ellen L, Neckles, Hilary, Poore, Barbara, Rideout, Stephen, Russell-Robinson, Susan, Weiskel, Peter K, 2003, Northeast Coastal Ecosystems and Resources Plan for Integrated Science, USGS OFR 03-0405.

Baucom, P.C., Bratton, J.F., Colman, S.M., Moore, J., King, J., Heil, C., and Seal, R., 2001, Selected data for sediment cores collected in Chesapeake Bay in 1996 and 1998, USGS OFR 01-194.

Bratton, J.F., Colman, S.M., Baucom, P.C., and Seal, R.S., II, 2000, Trace metals, stable isotopes, and biogenic silica from a core collected at Marion-Dufresne site MD99-2209, Chesapeake Bay, in Cronin, T. (ed.), Initial Report on IMAGES V Cruise of the Marion-Dufresne to Chesapeake Bay June 20-22, 1999, USGS OFR 00-306, Ch. 10, p. 102-111.

Pohlman, J.W., Bratton, J.F., and Coffin, R.B., 2000, Porewater methane geochemistry of Marion-Dufresne cores MD99-2205 and -2206, in Cronin, T. (ed.), Initial Report on IMAGES V Cruise of the Marion-Dufresne to Chesapeake Bay June 20-22, 1999, USGS OFR 00-306, Ch. 13, p. 130-133.

Colman, S.M., Bratton, J.F., and Baucom, P.C., 2000, Radiocarbon dating of Marion-Dufresne cores MD99-2204, 2207, and 2209, Chesapeake Bay, in Cronin, T. (ed.), Initial Report on IMAGES V Cruise of the Marion-Dufresne to Chesapeake Bay June 20-22, 1999, USGS OFR 00-306, Ch. 6, p. 72-77.

Baucom, P.C., Colman, S.M., Bratton, J.F., Rochon, A., and Friddell, J., 2000, Sedimentology and core descriptions of Marion-Dufresne cores MD99-2204 through MD99-2209, in Cronin, T. (ed.), Initial Report on IMAGES V Cruise of the Marion-Dufresne to Chesapeake Bay June 20-22, 1999, USGS OFR 00-306, Ch. 5, p. 49-71.

PUBLISHED ABSTRACTS

Michael, HA, KD Kroeger, C Fernandez, LF Konikow, AH Sawyer, CJ Russoniello, JF Bratton, submitted, Impact of groundwater flowpaths on subsurface denitrification and nutrient loading to an estuary, American Geophysical Union Fall Meeting, 9-13 December 2013, San Francisco, CA.

Bratton John F., Howard Reeves, Norm Grannemann, Larry Lemke (panel), 2013, Gaps in understanding of the role of groundwater in Great Lakes biogeochemical processes, Recent Changes in the Biogeochemistry of the Great Lakes System Workshop, March 11-13, 2013, Wayne State University, Detroit, Michigan.

Bratton, John, Jia Wang, Drew Gronewold, Brent Lofgren, Marie Colton, 2013, Tools for prediction and management of climate change impacts on natural resources in the Great Lakes and the Arctic, 11th Annual Climate Prediction Applications Science Workshop, April 23-25, 2013 Logan, Utah.

Andres, A. Scott, Holly Michael, John Madsen, Chris Russoniello, Cristina Fernandez, John Bratton, VeeAnn Cross, 2013, Integration of multiple geophysical techniques to image a submarine groundwater discharge zone, NGWA Summit--The National and International Conference on Groundwater, April 28-May 2, 2013, San Antonio, Texas.

Horvatin, P.J., Nettesheim, T.G., Newman, K.R., Majerus, K., Braverman, C.T., Glassner-Shwayder, K., Keough, J.R., Bratton, J.F., Kolka, R., Carl, L.M., Colton, M., Stow, C., Faust, M., Krueger, C.C., Bunnell, D.B., Stirratt, H.M., Czarnecki, C.A., and Drott, E., 2013, An Adaptive Science-Based Framework for Great Lakes Restoration, International Association for Great Lakes Research, 56th Annual Conference, 2-6 June 2013, West Lafayette, Indiana.

Bratton, John F., 2013, A conceptual typological model for coastal environments in the Great Lakes, International Association for Great Lakes Research, 56th Annual Conference, 2-6 June 2013, West Lafayette, Indiana.

Wang, J., X. Bai, J. Austin, R.A. Assel, J.F. Bratton, M.C. Colton, J. Lenters, B.M. Lofgren, D.J. Schwab, and A.H. Clites, 2013, A record breaking low ice cover over the Great Lakes during winter 2011/2012, International Association for Great Lakes Research, 56th Annual Conference, 2-6 June 2013, West Lafayette, Indiana.

Baskaran, M., and Bratton, J.F., 2013, Report on the Workshop entitled "Recent Changes in the Biogeochemistry of the Great Lakes System" held on 11-13 March, 2013 at Wayne State University, Detroit, MI, International Association for Great Lakes Research, 56th Annual Conference, 2-6 June 2013, West Lafayette, Indiana.

Michael, Holly A., Christopher J. Russoniello, Cristina Fernandez, Leonard F. Konikow, A. Scott Andres, John F. Bratton, Joel F. Banaszak, and David E. Krantz, 2012, Geologic effects on subsurface salinity distributions, groundwater flowpaths, and aquifer-estuary exchange in Indian River Bay, Delaware, USA, 22nd Salt Water Intrusion Meeting, 17-22 June 2012, Búzios, Brazil.

Bratton, John F., Kevin D. Kroeger, Steven A. Ruberg, Holly A. Michael, and David E. Krantz, 2012, Comparison of methods and results in recent studies of direct groundwater discharge to the Atlantic coast and Great Lakes, 22nd V.M. Goldschmidt Conference, 24-29 June 2012, Montreal, Quebec, Canada.

Bratton, John F., and Mark Baskaran, 2012, Recent advances in understanding of biogeochemical and hydrological processes in the Great Lakes Basin using natural and anthropogenic tracers, International Association for Great Lakes Research Annual Conference, 13-17 May 2012, Cornwall, Ontario.

Kroeger, K.D., C. Fernandez, C. Russoniello, A.S. Andres, J.F. Bratton, J.K. Böhlke, L. Konikow, H.A. Michael, 2012, Denitrification and nitrogen loading at the aquifer/estuary interface: The role of coastal hydrology and implications for management of nitrogen loads, AGU Ocean Sciences Meeting, Salt Lake City, UT.

Glynn, Pierre, L. Jacobsen, G. Phelps, G. Bawden, V. Grauch, R. Orndorff, R. Winston, M. Fienen, V. Cross, and J. Bratton, 2011, 3D/4D modeling, visualization and information frameworks: Current U.S. Geological Survey practice and needs, *in* Russell, H.A.J., Berg, R.C., and Thorleifson, L.H. (compilers), Three Dimensional Geological Mapping Workshop, Extended Abstracts, Minneapolis, Minnesota – October 8, 2011; Geological Survey of Canada, Open File Report #####, p. 33-38.

Bratton, John F., 2011 Conceptualizing and studying submarine groundwater flow and discharge at beach to shelf scales, Geological Society of America Annual Meeting, Paper No. 158-1, 9-12 October 2011, Minneapolis, MN (invited).

Bratton, John F., Nalepa, Thomas F., and Fusaro, Abigail J., 2011, Evolution of the Great Lakes ecosystems through time: Ice, innovation, introduction, and invasion, Geological Society of America Annual Meeting, Paper No. 214-13, 9-12 October 2011, Minneapolis, MN.

Michael, H., Fernandez, C., Russoniello, C., Andres, A.S., Kroeger, K., Krantz, D., Banaszak, J., Musetto, A., Myers, K., Konikow, L., and Bratton, J., 2011, Geologic and hydrologic control of porewater chemistry and submarine groundwater discharge into Indian River Bay, Delaware, Goldschmidt Conference Abstracts, Mineralogical Magazine, vol. 75, no. 3, p. 1462, 14-19 August 2011, Prague, Czech Republic.

Fernandez, C., Kroeger, K.D., Bratton, J.F., Russoniello, C.J., Musetto, A.I., Andres, A.S., Michael, H.A., 2011, Porewater salinity distribution and geochemical characterization beneath Indian River Bay, Delaware, National Ground Water Association Ground Water Summit, 1-5 May 2011, Baltimore, MD.

Michael, Holly A., Christopher J. Russoniello, Cristina Fernandez, Andrew Musetto, Kevin Myers, John F. Bratton, A. Scott Andres, David E. Krantz, Joel F. Banaszak, Kevin D. Kroeger, and Leonard F. Konikow, 2011, Spatial patterns in subsurface salinity and submarine groundwater discharge into Indian River Bay, Delaware, National Ground Water Association Ground Water Summit, 1-5 May 2011, Baltimore, MD.

Bratton, J.F., Kroeger, K., Crusius, J., Schubert, C., Paulsen, R., Green, A., Wanlass, J., Baldwin, S., Abbene, I., and Young, C., 2010, Control of submarine groundwater flow and chemistry by onshore and offshore buried peat along a developed Long Island shoreline, American Geophysical Union Fall Meeting, 13-17 December 2010, San Francisco, CA, Abstract H42A-01.

Moseman-Valtierra, Serena, Kevin Kroeger, Jim Tang, Kelsey Fisher, John Bratton, John Crusius, 2010, Shifts and dynamics of greenhouse gas fluxes in coastal marshes: Responses to short- and long-term nitrogen additions, American Geophysical Union Fall Meeting, 13-17 December 2010, San Francisco, CA, Abstract B24A-04.

Moseman-Valtierra, S.M., K.A. Kroeger, R. Gonzalez, J. Tang, J. Crusius, J. Bratton, T. Brooks, and A. Green, 2010, Is nitrogen loading shifting coastal wetlands from sinks to sources of greenhouse gases? Ecological Society of America annual meeting, 1-6 August 2010, Pittsburgh, PA.

Bratton, John F., and others, 2010, Submarine groundwater discharge to Great South Bay from Long Island and Fire Island, New York; 7th Biennial Fire Island National Seashore Planning, Science, and Research Conference, 21-22 April 2010, Patchogue, NY (invited).

Bratton, John F., 2010, Conceptual models of controls on spatial variability of submarine groundwater flow and discharge, American Society of Limnology and Oceanography Annual Meeting, Santa Fe, NM, 7-11 June 2010, Santa Fe, NM.

Bratton, John F., VeeAnn A. Cross, and David S. Foster, 2010, Exploring the evolution of Chesapeake Bay over the last two glacial cycles using 3D visualization and animation, Northeast/Southeast Sections Joint Meeting, Geological Society of America, Abstracts with Programs, Abstract 77-2, 13-16 March 2010, Baltimore, MD.

Colman, J.A., Bratton, J.F., Crusius, J., Kroeger, K.D., Baldwin, S., and Lee, K., 2009, Transient modeling of reactive solute transport in a submarine groundwater discharge zone, American Geophysical Union Fall Meeting, Abstract H13H-07.

Bratton, John F., John Crusius, Kevin Kroeger, Christopher Schubert, Ruth Coffey, and Henry Bokuniewicz, 2009, Submarine groundwater discharge to Great South Bay from Long Island and Fire Island, New York, Geological Society of America Annual Meeting, Abstracts with Programs, Abstract 149-2, Portland, Oregon, 18-21 October 2009.

Green, A.C., Kroeger, K., Crusius, J., Bratton, J.F., Baldwin, S., and Brooks, T.W., 2009, Quantifying greenhouse gas concentrations in coastal groundwater discharging to Great South Bay and Long Island Sound, NY, Geological Society of America Annual Meeting, Abstracts with Programs, Abstract 149-9, Portland, Oregon, 18-21 October 2009.

Kroeger, K., Crusius, J., Bratton, J.F., Charette, M.A., Swarzenski, P.W., Tucker, J., Giblin, A.E., Casciotti, K., Cole, M.L., Valiela, I., 2009, Nitrogen biogeochemistry of submarine groundwater discharge: A synthesis, Geological Society of America Annual Meeting, Abstracts with Programs, Abstract 149-8, Portland, Oregon, 18-21 October 2009.

Moseman, S.M., Kroeger, K., Green, A., Baldwin, S., Crusius, J., and Bratton, J., 2009, Nitrogen loading affects the climatic role of coastal marine wetlands, Society for the Advancement of Chicanos and Native Americans in Science National Conference, Dallas, Texas, 15-18 October 2009.

Kroeger, K.D., Crusius, J., Giblin, A., Tucker, J., Bratton, J., Baldwin, S., and Green, A., 2009, Dinitrogen and noble gas tracers of denitrification in submarine groundwater discharge zones, 2nd International Multidisciplinary Conference on Hydrology and Ecology: Ecosystems Interfacing with Groundwater and Surface Water, Vienna, Austria.

Green, A.C., Crusius, J., Kroeger, K.D., Pugh, E.R., Baldwin, S.M., Bratton, J.F., 2008, Variability of nitrous oxide fluxes from West Falmouth Harbor, Cape Cod, Massachusetts, American Geophysical Union Fall Meeting.

Crusius, J., Kroeger, K., and Bratton, J.F., 2008, Significant groundwater discharge of nutrients to western Long Island Sound inferred from radioisotope, nutrient and organic geochemical tracers, American Geophysical Union Fall Meeting.

Baldwin, Sandra M., Bratton, J.F., Crusius, J., Kroeger, K.D., Green, A.C., Erban, L., 2008, The role of submarine groundwater discharge in the delivery of nitrogen to the Corsica River Estuary, Maryland, American Geophysical Union Fall Meeting.

Bratton, John F., John Crusius, Kevin Kroeger, Ruth Coffey, Henry Bokuniewicz, VeeAnn Cross, Charles Worley, Adrian Green, Michael Casso, Sandra Baldwin, and Laura Erban, 2008, Contrasting conditions of coastal groundwater discharge in two Long Island estuaries, Geological Society of America Annual Meeting, Houston, Texas, 5-9 October 2008, Abstracts with Programs.

Crusius J., Kroeger K. D., Bratton J. F., Erban L., Green A., Baldwin S., and Sundquist E., 2008, N₂O fluxes from coastal waters due to submarine groundwater discharge, 18th Annual V.M. Goldschmidt Conference on Geochemistry, Vancouver, British Columbia, Canada, 13-18 July 2008, *Geochimica et Cosmochimica Acta*, vol. 72, p. A191.

Bratton, J.F., J. Crusius, K. Kroeger, J.K. Böhlke, J. Bowen, V. Cross, C. Worley, L. Erban, A. Green, and S. Baldwin, 2008, Steep age and salinity gradients in submarine groundwater measured in a small Chesapeake Bay tributary, American Geophysical Union Ocean Sciences Meeting, 2-7 March 2008, Orlando, FL.

- Crusius, J., Erban, L., Jenkins, W.J., Giblin, A., Kroeger, K., Foreman, K., Bratton, J.F., 2008, Radon-222 as a tracer of coastal groundwater discharge: examining controls on spatial variability, American Geophysical Union, Ocean Sciences Meeting, 2-7 March 2008, Orlando, FL.
- Bowen, J., Kroeger, K., Crump, B., Crusius, J., Bratton, J., 2007, Microbial community composition along a salinity gradient in a subterranean estuary, Estuarine Research Federation Annual Meeting, 4-8 November 2007, Providence, Rhode Island.
- Erban, L., Crusius, J., Koopmans, D., Giblin, A., Kroeger, K., Foreman, K., Bratton, J., 2007, Radon-222 as a tracer of coastal groundwater discharge: examining controls on spatial variability of Radon-222, Estuarine Research Federation Annual Meeting, 4-8 November 2007, Providence, Rhode Island.
- Bratton, John F., 2007, Holocene sedimentation in a kettle pond breached by rising sea level on Cape Cod, Northeast Section Meeting, Geological Society of America, Abstracts with Programs, 12-14 March 2007, Durham, NH.
- Crusius, John, Giblin, Anne, Foreman, Ken, Bratton, John, Erban, Laura, and Koopmans, Dirk, 2007, Nutrient delivery to West Falmouth Harbor (MA) from groundwater: Examining the contribution from the wastewater treatment facility, Northeast Section Meeting, Geological Society of America, Abstracts with Programs, 12-14 March 2007, Durham, NH.
- Bratton, John F., 2007, The importance of shallow confining units to submarine groundwater flow, International Union of Geodesy and Geophysics (I.U.G.G.) XXIV General Assembly, Perugia, Italy, July 2-13, 2007, Session HS1001 (invited).
- Bratton, John F., John A. Colman, John Crusius, Timothy D. McCobb, Andrew J. Massey, Dirk J. Koopmans, and John P. Masterson, 2006, Evidence and implications of a fresh groundwater flow system beneath a shallow coastal estuary in New England, SWIM/SWICA III conference, Cagliari – Chia Laguna, Italy, 24-29 September 2006.
- Crusius, J., A. Trescott, J. Bratton, D. Koopmans, and A. Giblin, 2006, Strengths and limitations of groundwater discharge estimates based on radon and radium isotopes: An example from a small Massachusetts estuary, Ocean Sciences Meeting, Honolulu, Hawaii.
- Bratton, John, Crusius, John, Cross, VeeAnn, and Koopmans, Dirk, 2005, Delineation of nearshore freshwater-saltwater relationships in submarine ground water using continuous resistivity profiling and piezometer transects in the Neuse River Estuary, Geological Society of America, Annual Meeting, Abstracts with Programs, v. 37, no. 7, p. 471, Abstract 211-13.
- Kroeger, K., Charette, M.A., Swarzenski, P.W., Crusius, J.F., and Bratton, J.F., 2005, Contrasting nitrogen biogeochemistry and fluxes from a temperate and subtropical coastal aquifer, Estuarine Research Federation Annual Meeting, Norfolk, VA.
- Crusius, J., Bratton, J., Koopmans, D., Spruill, T., and Corbett D.R., 2005, Submarine groundwater discharge to the Neuse River Estuary (NC) constrained from continuous measurements of ²²²Rn, Estuarine Research Federation Annual Meeting, Norfolk, VA.
- Bratton, J.F., Cross, V.A., Foster, D.S., Crusius, J.F., and List, J.H., 2005, Submarine hydrogeology of a glaciated coastline: Cape Cod National Seashore, New England Estuarine Research Society, Annual Meeting, Eastham, MA.
- Crusius, J., Koopmans, D., Bratton, J., Ryckman, L., Charette, M., Halloran, K., Kroeger, K., Henderson, P., and Colman, J., 2005, Submarine groundwater discharge to Salt Pond (CCNS) estimated from salinity and continuous ²²²Rn measurements and a box model, New England Estuarine Research Society, Annual Meeting, Eastham, MA.

Spruill, T., Bratton, J., Crusius, J., Wrege, B., and Strickland, G., 2005, A Preliminary evaluation of nutrient and ground-water fluxes to the Neuse River Estuary, NC, Water Resources Research Institute, 8th Annual Conference, Raleigh, NC.

Cross, V.A., Foster, D.S., and Bratton, J.F., 2005, Integration of continuous resistivity profiling and seismic-reflection data in the near-shore environment, Coastal GeoTools '05, Myrtle Beach, SC, 7-10 March 2005.

Colman, J.A., Bratton, J.F., Charette, M.A., and Crusius, J., 2005, Flow-model, salt-balance, seepage-meter, radon, and geophysical estimates of ground-water discharge to a marine embayment, American Society of Limnology and Oceanography Annual Meeting, Salt Lake City, UT, 20-25 February 2005.

Bratton, J.F., J.F. Crusius, J.K. Meunier, T.B. Spruill, and B.M. Wrege, 2004, Use of continuous resistivity profiling to detect low-salinity ground water beneath the upper Neuse River Estuary, North Carolina, Eos Trans. AGU, v. 85, no. 47, Fall Meet. Suppl., Abstract H24A-04.

Crusius, J., D.J. Koopmans, L. Ryckman, M. Charette, K. Halloran, K. Kroeger, P. Henderson, J. Bratton, J. Colman, and J. Masterson, 2004, Submarine groundwater discharge to Salt Pond, Massachusetts, estimated from continuous ²²²Rn measurements, Eos Trans. AGU, v. 85, no. 47, Fall Meet. Suppl., Abstract H24A-06.

Bratton, John F., Corbett, E.R., Krantz, D.E., Thieler, E.R., 2003, Occurrence of fresh and brackish ground water beneath Atlantic barrier islands and estuaries, Geological Society of America, Annual Meeting, Abstracts with Programs, v. 35, n. 6, p. 252.

Thieler, E.R., Riggs, S.R., Hoffman, C.W., Wehmiller, J.F., Mallinson, D.J., Foster, D.S., Culver, S.J., Farrell, K.M., Bratton, J.F., and McNinch, J.E., 2003, The record of Quaternary sea-level change, North Carolina coastal plain, Mid-Atlantic U.S., XVI INQUA Congress, Program with Abstracts, Reno, Nevada.

Bratton, J.F., Thieler, E.R., Hoffman, C.W., and Brooks, R.W., 2002, Ground-water salinity and isotope stratigraphy of North Carolina's Outer Banks, Eos [Supplement], Transactions, American Geophysical Union.

Culver, S. J., Riggs, S.R., Thieler, E.R., Wehmiller, J.F., Snyder, S.W., Mallinson, D.A., and Bratton, J.F., 2002, Quaternary sea-level fluctuations and environmental change indicated by subsurface foraminiferal assemblages, Outer Banks, North Carolina, Eos Trans. AGU, 83(47), Fall Meet. Suppl., Abstract OS71B-0284.

Krantz, David E., Manheim, Frank T., Bratton, John F., 2001, Hydrostratigraphic framework and controls on ground-water discharge to Maryland and Delaware coastal bays, Geological Society of America, Annual Meeting, Abstracts with Programs, v. 33, no. 6, p. A-42.

Manheim, Frank T., David E. Krantz, Donald S. Snyder, John Bratton, Eric .A. White, Brian Sturgis, and John A. Madsen, 2001, Streaming resistivity surveys and core drilling define groundwater discharge in coastal bays of the Delmarva Peninsula, Geological Society of America, Annual Meeting, Abstracts with Programs, v. 33, no. 6, p. A-42.

Bratton, John F., and Colman, Steven M., 2001, Reconstruction of eutrophication history of Chesapeake Bay using fluxes to sediment of rhenium, molybdenum, and uranium, Geological Society of America, Annual Meeting, Abstracts with Programs, v. 33, no. 6, p. A-224.

Colman, S.M., and Bratton, J.F., 2001, Changes in sediment flux and diatom productivity over the last millennium in Chesapeake Bay, International Geosphere Biosphere Program, Open Science Meeting, Amsterdam, Netherlands.

Bratton, J.F., Colman, S.M., Thielert, E.R., Seal, R.R., II, and Baucom, P.C., 2000, Geochemical evidence of a rapid sea-level rise event in Chesapeake Bay at 7.6 ka, *Eos [Supplement]*, Transactions, American Geophysical Union, v. 81, no. 48, p. F618-F619.

Krantz, D.E., Manheim, F.T., Bratton, J.F., and Madsen, J.A., 2000, Hydrogeological framework and ground-water transport pathways to coastal bays, Delmarva peninsula, Geological Society of America, Annual Meeting, Abstracts with Programs, v. 32, no. 7, p. A-437.

Baucom, P.C., Colman, S.M., and Bratton, J.F., 1999, Biogenic silica trends in Chesapeake Bay, *Eos [Supplement]*, Transactions, American Geophysical Union, v. 80, no. 46, p. F46.

Colman, S., Cronin, T., Bratton, J., Baucom, P., and Poag, W., 1999, Chronology of sedimentation in the Chesapeake Bay from recent coring programs, including the 1999 R/V Marion Dufresne IMAGES leg, *Eos [Supplement]*, Transactions, American Geophysical Union, v. 80, no. 46, p. F1.

Bratton, J.F., S.M. Colman, and G. Ravizza, 1999, Sedimentary rhenium enrichment and hypoxia in Chesapeake Bay, Geological Society of America, Annual Meeting, Abstracts with Programs, v. 31, no. 7, p. A-460.

Cronin, Thomas M., Debra A. Willard, Stacey Verardo, Randy Kerhin, Steve Colman, John Bratton, and Charles Holmes, 1999, Chesapeake Bay Holocene climatic and ecosystem history, 25th Assateague Shelf and Shore Conference, Lewes, Delaware.

Bratton, John F., Steven M. Colman, Robert R. Seal, II, and Richard W. Murray, 1998, Anoxia history in Chesapeake Bay based on nitrogen isotopes and redox-sensitive metals, *Eos [Supplement]*, Transactions, American Geophysical Union, v. 79, n. 4, p. F496.

Bratton, John F., and Jed Day, 1997, Very Early Famennian (Upper Devonian) brachiopod sequence in the Pilot Basin of Eastern Nevada and Western Utah, and post Frasnian-Famennian extinction brachiopod recovery, The Amadeus Grabau Symposium: International Meeting on Cyclicity and Bioevents in the Devonian System, Program and Abstracts, University of Rochester, New York, p. 20.

Bratton, John F., 1996, Strong negative carbon and oxygen isotope anomalies associated with the Frasnian-Famennian mass extinction horizon in western Utah, Geological Society of America, Annual Meeting, Abstracts with Programs, v. 28, no. 7, p. A-54.

Bratton, John F., 1996, Brachiopods and oxygen levels during the survival interval of the Late Devonian mass extinction recovery in the Great Basin, western U.S.A., Sixth North American Paleontological Conference, Abstracts of Papers, Smithsonian Institution, Washington, D.C., Paleontological Society Special Publication No. 8., p. 44.

Bratton, John F., 1995, Bottom water re-oxygenation during the Frasnian-Famennian mass extinction recovery interval in western Utah, Geological Society of America, Annual Meeting, Abstracts with Programs, v. 27, no. 6, p. A-370.

PROFESSIONAL SERVICE

- USGS Research Grade Evaluation, Promotion Review Panel, Woods Hole Science Center, 2003; chair in 2008
- USGS Chesapeake Bay Science Advisory Committee, 2006-2010
- Co-convener with Walter Barnhardt, Geological Society of America Annual Meeting, special session: What goes up must come down: The science and policy of dam removal, 2005
- Co-convener with Jasper Knight and Reide Corbett, Earth System Processes 2 Meeting, Calgary, special session: Sediment dynamics and fluid flow across continent-ocean margins, 2005
- USGS Atlantic Coastal Plain Science Advisory Committee, 2003-2010
- USEPA Northeast Atlantic Indicators Conference, Steering Committee, 2003-2004
- Co-convener with Jennifer Morford, Geological Society of America Annual Meeting, special session: Geochemistry of organic-rich sediments from estuaries, continental shelves, basins, and upwelling zones, 2001
- Manuscript reviewer for Geology, Marine Geology, Marine Chemistry, Limnology & Oceanography, Science of the Total Environment, Estuaries and Coasts, Annals of Glaciology, American Association of Petroleum Geologists Bulletin and AAPG Books, Journal of Hydrology, Water Resources Research, Journal of Marine Systems, Elsevier Developments in Palaeontology series
- Proposal reviewer: Ocean Drilling Program, National Science Foundation, Natural Environment Research Council (U.K.), Natural Sciences and Engineering Research Council of Canada (NSERC), European Science Foundation, American Chemical Society Petroleum Research Fund, BMBF-MOST German-Israeli Research Fund, Federal Energy Regulatory Commission, Department of Commerce Economic Development Authority Working Waterfronts Program, NOAA Hollings Fellowship Program, NOAA Cooperative Institutes
- Document reviewer: Intergovernmental Panel on Climate Change (Wetlands Supplement), NOAA Blue Carbon Plan
- Woods Hole Oceanog. Inst. Post-Doc Review Committee, USGS Rep., 1999-2000, 2010
- USGS Pfiesteria Advisory Committee, 1998-1999
- Woods Hole Science and Technology Education Partnership, 1998-2010
- Geological Society of America: Student Representative to Education Committee, 1996-97; Research Grants Committee, 2000-2002 (chair in 2002); Joint Technical Program Committee, 2010-2012
- Co-chair, UC-Berkeley Dept. of Geology & Geophysics Speakers Program, 1997

FIELD AND OCEANOGRAPHIC CRUISE EXPERIENCE

- R/V Storm, sinkhole and pockmark reconnaissance, Lake Huron, Michigan, 2013
- R/V Knob, electrical resistivity surveying, groundwater and surface water sampling, Indian River Bay, DE, 2010-2011
- R/V Terrapin, electrical resistivity surveying, groundwater sampling, Long Island estuaries, New York, 2008-2009
- R/V Terrapin, electrical resistivity surveying, groundwater and surface water sampling, Corsica River Estuary, Maryland, 2007
- R/V Kerhin, radon mapping, seismic and electrical resistivity surveying, Potomac River Estuary, 2006

- R/V Musky II and R/V Bowfin, radon mapping and sampling, Lake Erie, 2005
 - R/V Haeni, R/V Rafael, R/V Terrapin, and TG&B barge, electrical resistivity surveying, acoustic imaging, radioisotope sampling, drilling, Rhode Island, Cape Cod, 2004-2008
 - R/V Beeliner, electrical resistivity surveying, radioisotope sampling, Neuse River Estuary, NC, 2004, 2005
 - R/V Ronald H. Brown, Northern Gulf of Mexico Deep Sea Habitats, NOAA Office of Exploration Cruise with ROV Innovator, 2003
 - Hi-Tide Marine/Hillis-Carnes barge drilling, Chincoteague Bay, MD, 2003
 - Boardt-Longyear rotosonic drilling, Outer Banks, NC, 2003
 - DE-DNREC/MPI barge drilling, Indian River Bay, DE, 2001
 - R/V Ariadne II and Hoverprobe, Delmarva Coastal Bays, coring, 2000-2001
 - R/V Cape Henlopen, Chesapeake Bay, coring and sampling, 2000
 - R/V Marion Dufresne, IMAGES V-GINNA Leg 1; Chesapeake Bay, New Jersey Shelf, Gulf of St. Lawrence, Canada, coring and sampling, 1999
 - R/V Discovery, Chesapeake Bay, acoustic imaging and coring, 1998
 - NV and UT, chemostratigraphic and paleontological sampling, 1995-96
 - NH, MA, VT, ME, CT, NJ, and CA, hydrogeological investigations, 1988-97
 - NM and AZ, geologic mapping, 1986
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GRANTS, SCHOLARSHIPS, AND AWARDS

- Co-PI (with Mark Baskaran, Wayne State Univ.), National Science Foundation, Chemical Oceanography Program, Biogeochemistry of the Great Lakes System Workshop Support, \$25,000, 2013
 - Co-PI (with Holly Michael, Univ. of Delaware, and others), National Science Foundation, Variable density modeling and field investigation of the subestuarine hydrogeological conditions beneath a Delaware coastal bay, \$625,000, 2009-2012
 - Co-PI, National Park Service WQPP Program, Characterizing submarine groundwater discharge to Great South Bay as a vital component of managing estuarine eutrophication, Fire Island National Seashore, NY, \$300,000, 2008-2010
 - Co-PI, National Fish and Wildlife Federation, Submarine groundwater discharge to Long Island Sound, \$200,000, 2007-2009
 - Co-PI, USGS Venture Capital Fund, Greenhouse gas fluxes at the land/sea margin: A poorly quantified feedback, \$30,000, 2007-2008
 - Co-PI, USGS Venture Capital Fund, Development of a continuous radon measuring system for mapping coastal groundwater discharge, \$40,000, 2004
 - Co-PI, USGS Atlantic Coastal Plain Integrated Science Grant, \$220,000, 2003-05
 - Proposal coauthor, NSF Geosciences, Education and Human Resources grant to Geological Society of America Research Grants Committee, \$450,000, 2002-04
 - Achievement Rewards for College Scientists - Northern California Chapter
 - Geological Society of America: Student Research Grants (2: 1995 and 1996), Special Merit Citation (1995); Congressional Science Fellowship Finalist, 1997
 - Sixth North American Paleontological Conference Student Travel Grant, 1996
 - Ralph Newton Memorial Fund Grant and Florence M. Lankershim Scholarship
 - University of California-Berkeley Vice Chancellor for Research Fund Grant
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RESEARCH INTERESTS

- Sedimentary geology and biogeochemistry, especially of organic-rich sediments
 - Laurentide glacial geology of the Great Lakes and New England
 - Delineation of rapid sea-level and lake-level change events
 - Paleoceanography and mass extinctions
 - Land-water exchange of nitrogen and phosphorus
 - Stable isotope (esp. ^{15}N and ^{13}C) biogeochemistry
 - Carbon cycling and methane, especially modern and ancient methane hydrates
 - Coastal groundwater discharge and ecosystems
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TEACHING INTERESTS

Physical Geology, Historical Geology, Sedimentary Geology, Environmental Geology, Biogeochemistry, Hydrogeology and Groundwater Pollution, Glacial Geology of North America, Field Geology, History and Future of the Creation-Evolution Controversy

REPRESENTATIVE ENVIRONMENTAL CONSULTING EXPERIENCE

Department of Defense

- Pease Air Force Base Superfund Site, NH: performed base closure activities including complex multi-site RI/FS (landfills, USTs, ASTs, fire training areas, solvent spills, fuel spills) and RD/RA under Installation Restoration Program; seismic refraction surveying, environmental sampling, installation of monitoring and recovery wells, hydraulic aquifer testing
- Alameda Naval Air Station, CA: designed sampling plan templates for 200+ parcels as part of Base Realignment and Closure, conducted stable isotope investigation of intrinsic bioremediation of refinery wastes and major aviation fuel spill including soil gas sampling and vacuum line gas separation
- Oak Knoll Naval Hospital, CA: wrote sampling plan for hospital campus sewer system possibly impacted by radioisotopes and hydrocarbons

Litigation Support and Oversight

- Pitney, Hardin, Kipp & Szuch, NJ; managed litigation support related to Superfund cleanup of PCB contamination of public combined sewer system, chemical plant, residential properties; prepared chronologies, deposition questions, review of remediation documents and analytical data, analysis of damages; performed site visit
- Burns & Levinson, MA: oversaw investigation by another consultant of dry cleaning supply facility impacted by chlorinated solvents
- Ropes & Gray, MA; performed litigation support related to contamination of soil and groundwater by low-pH waste lagoons containing hexavalent chromium at a former chemical plant; participated in site visit; historical aerial photo review

Municipal/State

- Town of Berwick, ME: supervised wastewater treatment plant and sludge landfill monitoring (incl. tannery waste stream); monthly water level measurements, quarterly ground water reports
- Town of Concord, NH: participated in demo/stump dump pre-closure investigation and municipal solid waste landfill monitoring, aquifer testing
- Town of Hooksett, NH: performed demolition debris landfill expansion investigation including installation of bedrock wells with air-rotary drilling
- NHDES, Sylvester Superfund Site, NH: assessed effectiveness of remediation (slurry wall/cap/pump & treat) system by groundwater flow modeling and analytical data review of 100-well database
- MADEP, Fournier/Gemme Site, MA: installed soil borings and supplemental monitoring well network at closed waste lagoons in former gravel pit

Industrial

- Confidential client, CT and CA: performed soil and groundwater contamination investigations, RCRA closures of waste lagoons, drum storage area, and industrial waste treatment facilities; supervised quarterly groundwater monitoring of 34-well network and prepared reports and closure documents
 - PRP Group, Union Chemical Company Superfund Site, ME: participated in major RI/FS and RD/RA at former solvent reclamation and incineration facility
 - Confidential client, CT: executed soil and groundwater contamination investigations of metal hydroxide sludge drying beds, wastewater lagoons, drum storage area, and jet fuel UST including test pits, soil borings, monitoring wells, pump tests, and slug tests
 - Confidential client, MA: installed wells and performed groundwater quality monitoring and estuarine sediment sampling at a large operating TSDF
 - Confidential client, NH: oversaw tasks in fast-track closure and major soil removal operation (including significant Level B SCBA work) at former tank truck depot prior to redevelopment of property; installed and sampled well network
 - Confidential client, NH: investigated closed landfill site as possible location for re-opening and raising final grade to accommodate additional municipal solid waste from greater Boston area
 - Confidential client, NH: performed groundwater and surface water monitoring of upgradient site for PRP client in contaminated town well field Superfund site
 - Confidential client, MA: characterized extent of impacts from degreaser tank rupture at former automobile engine reconditioning plant by soil borings and packer testing of monitoring wells in fractured bedrock
 - American Water Works Assoc., NH: performed field experiments on transfer of dissolved radon from water to household air in three subdivisions to inform EPA promulgation of water supply treatment standard for radon
 - Confidential client, NH: managed monitoring of solvent vapor extraction system and later assessment of effectiveness with soil borings
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